12 Deployment and Altered Climates

In this chapter you will learn about:

- Acclimation.
- General guidelines for altered environments.
- Maintaining performance in the heat, cold, and at altitude.

Adapting, or acclimating, to a new environment, such as extreme changes in climate or altitude, imposes considerable demands on the body. Proper acclimation is necessary in order for the body to function more efficiently in a new environment.

Acclimating to Altered Environments

Adapting to a new environment (e.g., heat, cold, altitude) can take one to three weeks. Having a good aerobic fitness base will accelerate your acclimation to new environments. However, factors that can negatively affect acclimation include:

- Dehydration.
- Drinking alcohol.
- Cessation of physical activity.
- Electrolyte depletion.
- Inadequate energy intake.
- Illness.
- Infection.
- Injury.
- Loss of sleep.

General guidelines for nutrition and physical activity in altered climates are outlined and followed by brief descriptions of the effects that heat, cold, and altitude have on metabolism.

General Nutrition Issues

Adapting to adverse environments increases energy expenditure and water losses. If energy and fluid needs are not met then performance will decline. Consult a registered dietitian if you have questions about your nutrient requirements. Strategies to maintain energy and fluid balance are:

Meeting Energy Needs

- Eat a high-CHO diet (roughly 60% of your total daily kcals) to meet increased kcal needs.
- Keep fat intakes to less than 30% of your total daily kcals.
- Keep protein intakes to about 10% of your total daily kcals. Also, avoid amino acid and protein supplements (see Chapter 2).
- Eat small frequent meals.
- Eat all components of your field rations.

Meeting Fluid Needs

Maintaining fluid balance is crucial to avoid dehydration (Chapter 2). Dehydration can limit performance and severe dehydration can be life-threatening. Tips for maintaining fluid balance include:

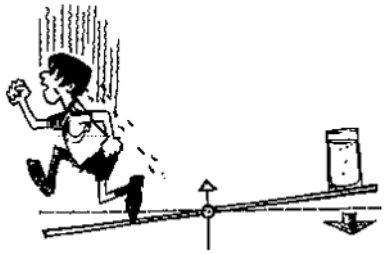
- Monitor hydration status (Chapter 11 page 70).
- Monitor fluid status by weighing yourself prior to and after prolonged physical activities. Drink 2 cups (0.45 L or 16 oz.) of water for every pound of body weight lost.
- Thirst is not a good indicator of fluid status. Drink fluids regularly throughout the day. When working in the heat, do not drink more than 6 cups of fluid an hour.
- When exercising or working for prolonged periods (›60 minutes), drink a fluid replacement beverage such as a sports drink instead of water (see Chapter 11, page 70).
- Avoid alcoholic beverages; alcohol increases fluid losses.
- Reduce caffeine consumption; caffeine increases fluid losses.
- Avoid salty foods; salt increases fluid needs.

Physical Activity Concerns

General considerations for physical work and exercising in environmental extremes include:

- Plan for decreased physical performance the first two weeks.
- Plan your workouts to avoid the hottest or coldest times of the day and allow adequate time for warm-ups.
- Drink plenty of fluids and eat enough kcals to replace lost fluids, CHO, and electrolytes.
- Be aware of conditions that may predispose you to dehydration (diarrhea, vomiting, fever). Also, avoid substances that can lead to dehydration such as caffeine and alcohol.

Hot Environments



When the temperature and humidity are over 85° F and 60%, respectively exercise should be performed indoors or undertaken with caution. Any time you perform physical activities in the heat, you will lose a lot of water and minerals through sweat. Although appetites may be suppressed in the hot weather, adequate caloric intake is important. Energy requirements can increase by 10% in order to maintain a normal body temperature.

If your activity level decreases, you don't need extra kcals!

Cold Environments

It is considered cold if the air temperature is below 15° F and the wind speed is greater than 25 m.p.h, or the water temperature is below 64°F. Cold environments increase energy metabolism and urination.

Soldiers can progressively lose weight when conducting field exercises in the cold for two to three weeks. Because this weight loss can cause fatigue and performance decrements, energy intake must increase to meet the increased energy demands. Energy requirements can increase 25 to 50% in the cold. To meet the increased energy and fluid needs, follow the guidelines on page 73. Also,

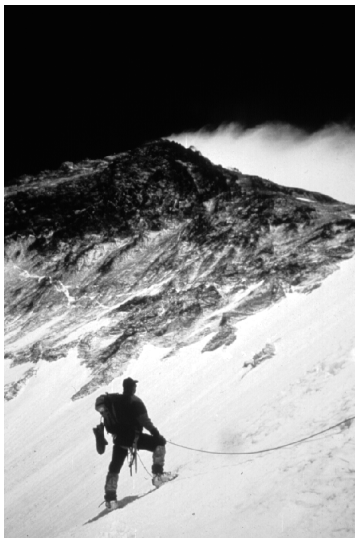
vitamin and mineral needs may increase, so eat all ration components to meet these needs.

Altitude

Ascent to altitude can cause a variety of physiologic disturbances due to the drops in temperature and humidity, and the lack of oxygen. Some major concerns are weight loss, disturbances in digestion, nutrient and fluid needs, and Acute Mountain Sickness (AMS). Adequate nutrition can play a crucial role in maintaining health and performance at altitude.

Energy requirements are 15-50% greater at altitude than at sea level. Virtually everyone who goes to higher altitudes experiences weight loss and loss of muscle mass. At altitudes below 5,000 m weight loss can be prevented by increasing your kcal intakes. Weight loss is inevitable above 5,000 m. To meet the increased energy and fluid needs at altitude follow the guidelines on page 73.

Vitamin and mineral needs are likely to increase at altitude. In particular, the increased metabolic rate and the lack of oxygen can increase the production of harmful free radicals. Preliminary research indicates that taking 400 IU per day of vitamin E, an antioxidant, at high altitude reduces free radical production.



As noted throughout this chapter, meeting energy and fluid requirements are vital to maintain physical performance in adverse environmental conditions. Being physically fit and eating a healthy diet prior to deployment will greatly improve your adaptation to the new environment.